Climate Change and Human Health Literature Portal

National Institute of Environmental Health Sciences

Marine downscaling of a future climate scenario in the North Sea and possible effects on dinoflagellate harmful algal blooms

Author(s):	Friocourt YF, Skogen M, Stolte W, Albretsen J
Year:	2012
Journal:	Food Additives & Contaminants. Part A, Chemistry, Analysis, Control, Exposure & Risk Assessment. 29 (10): 1630-1646

Abstract:

Two hydrodynamic and ecological models were used to investigate the effects of climate change-according to the IPCC A1b emission scenario - on the primary productivity of the North Sea and on harmful algal blooms. Both models were forced with atmospheric fields from a regional downscaling of General Circulation Models to compare two sets of 20-year simulations representative of present climate (1984-2004) conditions and of the 2040s. Both models indicated a general warming of the North Sea by up to 0.8 degrees C and a slight freshening by the 2040s. The models suggested that the eastern North Sea would be subjected to more temperature and salinity changes than the western part. In addition, the ecological modules of the models indicated that the warming up of the sea would result in a slightly earlier spring bloom. The one model that also computes the distribution of four different phytoplankton groups suggests an increase in the abundance of dinoflagellates, whereas the abundance of diatoms, flagellates and Phaeocystis sp. remains comparable to current levels, or decrease. Assuming that Dinophysis spp. would experience a similar increase in abundance as the modelled group of dinoflagellates, it is hypothesised that blooms of Dinophysis spp. may occur more frequently in the North Sea by 2040. However, implications for shellfish toxicity remain unclear.

Source: http://dx.doi.org/10.1080/19440049.2012.714079

Resource Description

Climate Scenario : ☒

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES), Other Climate Scenario

Special Report on Emissions Scenarios (SRES) Scenario: SRES A1

Other Climate Scenario: SRES A1B

Exposure : ☒

weather or climate related pathway by which climate change affects health

Food/Water Quality, Food/Water Quality

Food/Water Quality: Biotoxin/Algal Bloom, Biotoxin/Algal Bloom

☐

Climate Change and Human Health Literature Portal

Geographic Feature: ☒

resource focuses on specific type of geography

Ocean/Coastal

Geographic Location: ☒

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Region

Other European Region: North Sea

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Marine Toxin Syndrome

Model/Methodology: ☒

type of model used or methodology development is a focus of resource

Exposure Change Prediction

Resource Type: ☒

format or standard characteristic of resource

Research Article

Timescale: ☒

time period studied

Medium-Term (10-50 years)